211 Comparative effects of mannanoligosaccharide and an antibiotic in nursery diets on performance of pigs reared on three different farms. D. W. Rozeboom*[1], D. T. Shaw[1], J. E. Pettigrew[2], and A. Connolly[3], [1]*Michigan State University, East Lansing,* [2]*Pettigrew Consulting International, LCC, Louisianna, MO,* [3]*AllTech, Inc., Nicholasville, KY.*

The objective of this experiment was to compare the effects of dietary mannanoligosaccharide (MOS) and a feed-grade antibiotic on growth performance of pigs reared in three different, multiple-room nursery facilities. Two of the nurseries (A and B) were located on large-scale commercial farms. The third nursery (C) was located at Michigan State University. Nurseries were operated "continuous flow" by building, but "all-in/all-out" by room. Within each nursery, all pigs were in one room. Pigs (A, n = 771, 18.4 d weaning age; B, n = 576, 19.0 d weaning age; C, n = 96, 20.6 d weaning age) were blocked (within nursery) by weight and sex, and randomly allotted to dietary treatments, which were arranged in a 2 x 2 factorial design. The two factors were (1) with and without MOS (0.3% in phase 1, 0.2% in phases 2, 3, and 4; Bio-Mos™) and (2) with and without antibiotic (110 mg tylosin and 110 mg sulfamethazine per kg of diet in all phases; Tylan® 40 Sulfa-G™). The four nursery phases were 4, 7, 14, and 17 d, respectively. Other nutrients were at or slightly above concentrations suggested by NRC (1998). With 35, 20, and 4 pigs per pen in nurseries A, B, and C, respectively, space allowance per pig was 0.29, 0.26, and 0.56 m^2. Across all nurseries, ADG for the entire 42-d experiment was improved ($P < .05$) with the addition of MOS or antibiotic (368, 394, 406, and 410 g/d, for control, MOS, antibiotic, and MOS plus antibiotic, respectively). Performance differed depending on nursery facility ($P < .01$). There were no growth improvements with MOS in nurseries A and B. Antibiotic improved ($P < .05$) ADG in nursery A. Pigs in nursery C fed either MOS or antibiotic had greater ADG, ADFI, and G/F than controls ($P < .05$). The results of this study suggest that MOS may be an alternative to tylosin and sulfamethazine as a growth promotant in nursery diets.

Key Words: Swine, Mannanoligosaccharide, Antibiotic

212 Effect of *Quillaja saponaria* extract on weanling pig growth performance and immune function during acute enteric disease challenge. J.L. Turner*[1], S.S. Dritz[1], J.R. Werner[1], C.M. Hill[1], K. Skjolaas[1], K. Herkelman[2], and J.E. Minton[1], [1]*Kansas State University, Manhattan KS,* [2]*Farmland Industries, Inc., Kansas City MO.*

Quillaja saponaria (QS) extract has been in vaccine adjuvants for three decades. The saponin fraction of the extract can inhibit *E. coli* growth. We investigated the effect of dietary QS extract (without added antibiotics) on growth and immune function of nursery pigs challenged with *Salmonella typhimurium* (STC). A total of 96 pigs (8.6 kg) were assigned to eight treatments in a 2 x 4 factorial with main effects of disease challenge (control vs. STC) and dietary treatment (0, 125, 250, or 500 mg/kg added QS). ADG, ADFI, and G/F were determined on d 7, 14, 21, and 28 of the trial. On d 14, 48 pigs were infected orally with *S. typhimurium*. Daily feed intake (DFI) and rectal temperature (RT) were monitored for 7 d following STC. On d 0, 7, and 14 after STC, serum was analyzed for haptoglobin (HAPT) and α_1-acid glycoprotein (AGP). On d 0, 2, 4, and 6 post-challenge, serum IGF-I levels were determined. There were no differences ($P>.05$) in ADG, ADFI, G/F, DFI, RT, IGF-I, HAPT, or AGP between QS treatments. A STC by time interaction ($P<.05$) was observed for ADG, ADFI, G/F, DFI, RT, IGF-I, HAPT, and AGP. Prior to STC, ADG, ADFI, and G/F were similar between controls and STC-pigs. STC depressed ($P<.05$) ADG (0.7 vs. 0.41 kg/d), ADFI (1.05 vs. 0.78 kg/d), and G/F (0.67 vs. 0.51) in the wk following STC; however, ADG returned to control levels by wk 4. DFI was lower ($P<.05$) on d 2 to 5 following STC, and RT was increased ($P<.05$) on d 1, 2, 3, 4, and 6 post-challenge for STC-pigs. HAPT was elevated ($P<.05$) on d 7 post-challenge and AGP was higher ($P<.05$) on d 7 and 14 in STC-pigs. STC depressed ($P<.05$) IGF-I on d 2, 4, and 6 following STC. We conclude that this model of enteric disease invokes an acute phase response accompanied by a depression in circulating IGF-I. It appears that dietary inclusion of QS extract, at the levels reported herein, offers little benefit to growth performance or immune function in pigs undergoing an enteric disease challenge.

Key Words: Swine disease, IGF-I, Acute phase response

213 Effect of seaweed extract on weanling pig growth performance and immune function during acute enteric disease challenge. J.L. Turner*, S.S. Dritz, J.R. Werner, C.M. Hill, K. Skjolaas, and J.E. Minton, *Kansas State University, Manhattan KS.*

Extracts of seaweed plants have been shown to have antitumor effects in rodents. More recently the extract of the seaweed *Ascophyllum nodosum* (ANOD) has shown beneficial effects on fescue toxicosis in beef cattle. We investigated the effect of dietary ANOD (without added antibiotics) on growth and immune function of nursery pigs in the presence of *Salmonella typhimurium* challenge (STC). Pigs (6.8 kg) were blocked by weight and assigned randomly to one of eight treatments (two pigs per pen; six pens per treatment) in a 2 x 4 factorial with main effects of disease challenge (control vs. STC) and dietary treatment (0, 0.5, 1.0, or 2.0 % added ANOD). ADG, ADFI, and G/F were determined on d 7, 14, 21, and 28 of the trial. On d 14, 48 pigs were infected orally with *S. typhimurium*. During the 7 d following STC, daily feed intake (DFI) and rectal temperature (RT) were monitored. On d 0, 7, and 14 with respect to STC, serum was analyzed for haptoglobin (HAPT) and α_1-acid glycoprotein (AGP). There were no differences ($P>.05$) in ADG, ADFI, G/F, DFI, RT, HAPT, or AGP between ANOD treatments. A STC by time interaction ($P<.05$) was observed for ADG, ADFI, G/F, DFI, RT, HAPT, and AGP. Prior to STC, ADG, ADFI, and G/F were similar between controls and STC-pigs. STC depressed ($P<.05$) ADG (0.63 vs. 0.43 kg/d), ADFI (0.87 vs. 0.74 kg/d), and G/F (0.73 vs. 0.58) in the wk following STC; however, growth performance returned to control levels by wk 4. DFI was lower ($P<.05$) on d 2 to 4 following STC, and RT was higher ($P<.05$) on d 0 to 3 post-challenge for STC-pigs. HAPT declined over time in controls, while HAPT for STC-pigs were elevated ($P<.05$) on d 7 post-challenge. AGP was higher ($P<.05$) on d 7 and 14 post-challenge for STC-pigs compared to controls. In a companion study, culture of porcine alveolar macrophages with 10 mg/mL ANOD extract for 24 hr increased ($P<.05$) PGE_2 synthesis, but not tumor necrosis factor alpha. We conclude that this model of enteric disease is effective in eliciting an acute phase response. However, ANOD extract appears to offer little benefit to growth performance or immune function of nursery pigs in the presence or absence of STC.

Key Words: Swine disease, Seaweed, Immunity

214 Effect of Solutein™ (Sol) on rate and efficiency of body weight gain in weaned pigs. M.M. Ward* and D.R. Cook, *Akey, Inc., Lewisburg, OH.*

Four nursery trials utilizing 880, 880, 285 and 127 pigs weaned at 16 to 19 d of age, were conducted to determine the effect of Sol on growth performance. Sol is a water soluble product including spray-dried animal plasma and serum, serum globulin, lactose, citric acid, fructo-oligosaccharide, KCl, and DL-methionine. At weaning, pigs were transported 13h, randomly allotted (22/pen, 0.25 m^2/pig) to treatments based on body weight within gender, and given ad libitum access to dry pelleted feed, and water with or without Sol. In Exp. 1 (4.8 kg BW), Sol was administered through the water at 2.5% (wt/vol) up to d 4 and at 1.25% (wt/vol) from d 5 to 8 post-weaning. Pigs administered Sol from d 1 to 5 had greater ADG (124 vs 197 g, $P<.01$), higher ADFI (151 vs 182 g, $P<.01$), and improved feed:gain (1.65 vs 0.94, $P<.03$) vs control pigs. There were no differences ($P>.10$) in growth performance from d 6 to 14, however, administration of Sol for 8 d decreased pigs removed ($P<.01$) from test (9.5% vs 2.1%) vs the control. In Exp. 2 (5.0 kg BW), Sol was administered through the water for 0, 2, 4 or 8 d at 2.5% (wt/vol) from d 1 to 4 and 1.25% (wt/vol) from d 5 to 8 post-weaning. Pigs receiving Sol for 4 or 8 d had greater ADG (176, 188 vs 142, 129 g, $P<.09$) and improved feed:gain (0.95, 0.93 vs 1.16, 1.13, $P<.03$) vs pigs fed Sol for 0 or 2 d. Pigs fed no Sol had the highest percent mortality ($P<.01$). Over the 45 d trial, pigs administered Sol for 8 d were 0.73 kg heavier than control pigs ($P<.05$). In Exp. 3 (4.0 kg BW) and 4 (3.6 kg BW), Sol was added at 454 g/pen/d for 7 d (Exp. 3), or 227 g/pen/d for 3 d followed by 114 g/pen/d for 4 d (Exp. 4) with 40% water and 30% pelleted feed in a gruel feeder. Control pigs received gruel feed with no Sol. Dry pelleted feed and water were also offered ad-libitum. There was no difference ($P>.10$) in growth performance 7 d post-weaning between pigs fed Sol in gruel feed vs control pigs. In conclusion, administration of Sol for an initial 8 d post-weaning via water, but not gruel, improves growth performance throughout the nursery.

Key Words: Pigs, Plasma, Growth

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abstracts

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